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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

NELSON, MICHAEL E

ART UNIT

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4174

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DELIVERY MODE

11/15/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/535,311	Applicant(s) FUNAHASHI ET AL.	
	Examiner Michael E. Nelson	Art Unit 4174	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/22/2005</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION***Specification***

1. The disclosure is objected to because of the following informalities:
2. Frequently throughout the specification, presumably due to the translation from Japanese, the letter “r” is transposed with the letter “l.” Instances where this occurs should be corrected. A few examples are given below.
3. On page 1 and throughout the specification, Applicant refers to an **exciting** state referring to the result of hole-electron recombination. The standard terminology is **excited** state, and the specification would be clearer if **excited** state were used.
4. On page 2, line 12, Applicant states, “As the fluorescent molecule, a **coumalin**, cyanine, etc..” It is apparent that **coumarin** is intended.
5. On page 44, line 4, “A **grass** substrate” should be corrected to “A **glass** substrate.”
6. On page 50, in Table 3, **yerrow** should be corrected to **yellow**.
Appropriate correction is required.

Claim Objections

7. Claim 11 objected to because of the following informalities:
8. **Naphtylanthracene** should be corrected to **naphthylanthracene**.
9. Appropriate correction is required.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 1-13 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for certain materials, does not reasonably provide enablement for the full scope of the invention as claimed. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

12. Claims 1 and 2 claim an electroluminescent device where the light emitting layer comprises 3 materials, a light-emitting-layer material, a first dopant and a second dopant, with the relationship of the materials based on the relative valence energy (EV) and conductance energy (EC) and band gap difference (EG). The specification gives a few examples, and gives a list of potential materials suitable for the light-emitting-layer material (pages 16-20) and the dopant materials (page 22-25).

13. However, the scope of the claims encompasses **ALL** materials based simply upon a relationship between the EC, EV and EG values. As a result, an individual of ordinary skill in the art would have to test **ALL** (essentially trial and error) materials to practice the full scope of the invention as claimed. The specification does give some guidance in the form of particular materials, as given in the specification, but does not give guidance as to what **other** materials could be used as either the light-emitting-layer materials or the dopant materials. Short of trial and error, which falls well within the realm of unreasonable experimentation, an individual of ordinary skill would be unable to make the full scope of the invention as claimed; it is clearly undue experimentation.

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14. Furthermore, while the EC and EV values (and therefore the EG value) are commonly measured in the art, there is significant uncertainty in the values depending on the measurement method or even the individual practitioner. For example, the specification reports for ADN (H3) (EV=5.7, EC = 2.7, and EG=3.0), while Shi et al. (Applied Physics Letters, vol. 80, no. 17, pp. 3201-3203) report EV=5.8, EC = 2.6, and EG=3.2. (Fig. 1, page 3201) The degree of uncertainty in the values themselves makes it nearly impossible for an individual of ordinary skill to make the full scope of the invention as claimed.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

15. Claim 2 is rejected under 35 U.S.C. 102(b) as being anticipated by Burroughes et al. (WO 99/48160).

16. Concerning claim 2, Burroughes et al. describe an electroluminescent device comprising a first charge carrier injecting layer, and a second charge carrier injecting layer (pair of electrodes) and a light emitting layer comprised of a first component, second component and third component, where $EV_0 > EV_1$ and $EV_0 > EV_2$, and $EC_0 \geq EC_1$ and $EC_0 \geq EC_2$ (abstract, Fig. 12). In this case the Components are:

17. Component 0 (F8): $EV_0 = 5.8$, $EC_0 = 2.8$

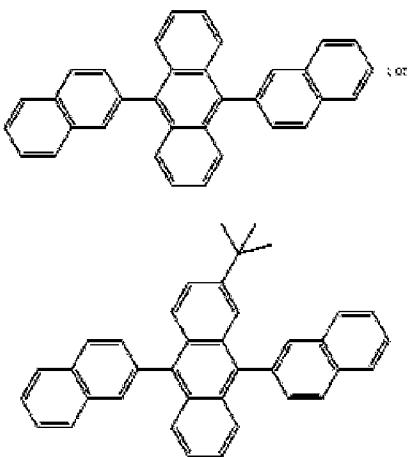
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18. Component 1 (TFB): $EV1 = 5.3$, $EC1 = 2.3$

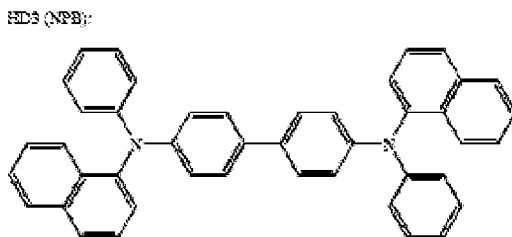
19. Component 2 (PFM): $EV2 = 5.0$, $EC2 = 2.1$

20. Claims 1,4-7, 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Hatwar et al. (6,475,648) with evidence from Shi et al. (Applied Physics Letters, vol. 80, no. 17, April 2002).

21. Concerning claim 1, Hatwar et al. describe an electroluminescent device comprised of a pair of electrodes (ITO and Al, Example 1, column 10, lines 20 and 34) comprised of a host and at least two dopants (column 1, lines 55-58), where the host consists of Alq or the following compounds (column 4, lines 5-25).

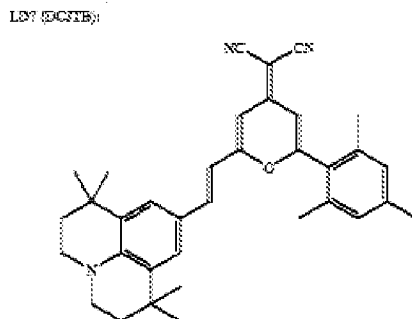


And where the first dopant is a tetraaryl amine and includes the following structure (column 6, lines 5-65):



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And the second dopant includes coumarins of the following structure: (column 9, lines 1-45)



22. Hatwar et al. disclose the EV and EC values for the above compounds (Fig. 3), except the anthracene compounds shown first. Shi et al. disclose the EV and EC values for ADN (anthracene dinaphthyl). The values are as follows:

23. Component 0 (ADN): EC0 = 2.6, EV0 = 5.8, EG0 = 3.2

24. Component 1: (DCJTB): EC1 = 3.11, EV1 = 5.26, EG1 = 2.15

25. Component 2: (NPB): EC2 = 2.45, EV2 = 5.46, EG2 = 3.01

26. Therefore,

27. EV0 (5.8) > EV1 (5.26), EV0 (5.8) > EV2 (5.46)

28. EC0 (2.6) > EC2 (2.45)

29. EG0 (3.2) > EG1 (2.15), EG0 (3.2) > EG2 (3.01)

30. While Hatwar et al. does not explicitly include the anthracene compound in the electroluminescent device, due to the explicit teaching of the anthracene compound as a host material by Hatwar et al. one of ordinary skill in the art would immediately envisage the device described.

31. Concerning claim 4, Hatwar et al. teach that the concentration of the first dopant to be 0.1-35%, and the second dopant to be 0.05-4% (column 9, lines 63-64). In the

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examples, Hatwar et al. use concentrations of (10% and 2%) respectively. (Table 1, column 11-12).

32. Concerning claim 5, the first dopant has a hole-injection aiding property, being a well-known hole transporting material.

33. Concerning claim 6, the difference between the EV0 and EV1 of the material described above is 0.34 eV, which is less than 0.4eV.

34. Concerning claim 7, the molecular weight of all of the materials is less than 1500.

35. Concerning claim 10, the light emitting material (host) is a well known electron transporting material.

36. Concerning claim 11, the light-emitting material (host material) is a naphthylanthracene derivative.

37. Claims 1-7, 9-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Hatwar et al. (6,967,062) with evidence supplied by Hatwar et al. (6,475,648).

38. Concerning claim 1, Hatwar et al. describe a white-emitting organic electroluminescence device comprising an anode and cathode, and a blue light emitting layer comprised of a light emitting material (host), a first dopant, and a second dopant.(abstract) The host is t-butyl-dinaphthylanthracene, the first dopant is the distyrylamine compound shown below, and the second dopant is a hole or electron transporting compound. The electron transport compound is Alq. (table 6, column 23 and 24). The values for EC and EV and EG are given, based on Applicants' Table 1, with the value for Alq provided by (6,475,648).

39. Component 0: TBADN (similar to H3) EV0 = 5.7, EC0 = 2.7, EG0 = 3.0

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40. Component 1: Alq (from 6,475,648) EV1 = 5.62, EC1 = 2.85, EG1 = 2.77

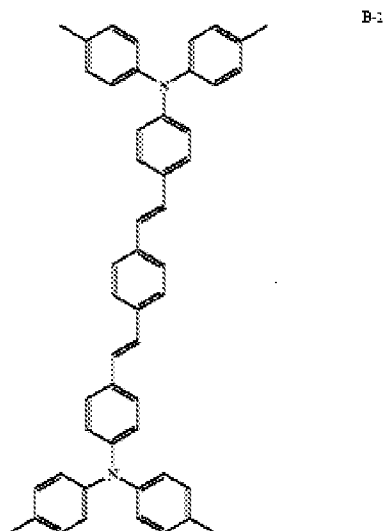
41. Component 2: B-1(similar to D3) EV2 = 5.4, EC2 = 2.5, EG2 = 2.9

42. Therefore

43. EV0 (5.7) > EV1 (5.62), EV0 (5.7) > EV2 (5.4)

44. EC0 (2.7) > EC2 (2.5)

45. EG0 (3.0) > EG1 (2.77), EG0 (3.0) > EG2 (2.9)



46. Concerning claim 2, Hatwar et al. describe a light emitting organic electroluminescent device comprising an anode and cathode, and a blue light emitting layer comprised of a light emitting material (host), a first dopant, and a second dopant.(abstract). The host is t-butyl-dinaphthylanthracene, the first dopant is the distyrylamine compound shown below, and the second dopant is a hole or electron transporting compound. In this case, the hole transport compound is NPB. (table 6, column 23 and 24). The values for EC and EV are given, derived from Applicants' Table

1

47. Component 0: TBADN (similar to H3) EV0 = 5.7, EC0 = 2.7, EG0 = 3.0

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48. Component 1: NPB (same as NPB) EV1 = 5.4, EC1 = 2.3 EG1 = 3.1

49. Component 2: B-1(similar to D3) EV2 = 5.4, EC2 = 2.5, EG2 = 2.9

50. Therefore

51. EV0 (5.7) > EV1 (5.4) and EV0 (5.7) > EV2 (5.4)

52. EC0 (2.7) > EC1 (2.3) and EC0 (2.7) > EC2 (2.5)

53. Concerning claim 3, Hatwar et al. describe the electroluminescent device from claim 2 above. In table 6, Hatwar et al. disclose the CIE coordinates for several devices, based on different amounts of dopant material. Comparing device 16 (0% Component 1) with device 19 (10% Component 1), we can see that the color has changed with the addition of the second dopant material. This indicates that emission is coming from both dopant materials.

54. Concerning claim 4, Hatwar et al. describe the electroluminescent device from claim 1 above. Hatwar et al. further disclose in table 6 that the content of the first dopant and the second dopant is 5 or 10% for dopant 1, and 2.5% for dopant 2.

55. Concerning claim 5, Hatwar et al. describe the electroluminescent device from claim 1 above, where the first dopant is Alq, a well-known electron transporting material.

56. Concerning claim 6, Hatwar et al. describe the electroluminescent device from claim 1 above, in that case the difference between EC0 and EC2 is 0.2.

57. Concerning claim 7, Hatwar et al. describe the electroluminescent device from claim 1 above, where all of the materials have a molecular weight between 100 and 1500.

58. Concerning claim 9, Hatwar et al. describe the electroluminescent device from claim 1 above, where the first dopant is a styrylamine compound.

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59. Concerning claim 10, Hatwar et al. describe the electroluminescent device from claim 1 above, where the host (light-emitting layer material) is TBADN, which is known to conduct electrons.

60. Concerning claim 11, Hatwar et al. describe the electroluminescent device from claim 1 above, where the host (light-emitting layer material) is TBADN, which is a naphthylanthracene derivative.

61. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

62. Claim 8 is rejected under 35 U.S.C. 102(e) as being anticipated by Hatwar et al. (6,967,062) with evidence supplied by Hatwar et al. (6,475,648) and further evidence supplied by Tsai et al. (Applied Physics Letters, vol 89, pp. 243521-1-243521-3, 2006).

63. Concerning claim 8, Hatwar et al. describe the electroluminescent device as discussed above. They do not report the glass transition temperature of the light emitting layer, however. The glass transition temperature is an inherent feature of the material forming the layer, in this case, predominantly TBADN. Tsai et al. report the glass transition temperature of TBADN to be 126°C. Therefore, it would be reasonable for the layer composed of mostly TBADN to have a glass transition temperature above 100°C.

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Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

64. Claims 1, 4-7 and 9-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Jarikov (7,183,010) with evidence supplied by Jiang et al. (Thin Solid Films, vol. 401, pp. 251-254, 2001) and Rost et al. (Synthetic Metals, vol 146, pp. 237-241, 2004).

65. Concerning claim 1, Jarikov describes electroluminescent devices comprised of a pair of electrodes (ITO and Mg:Ag) (example 1, column 74, lines 39-51) and a light emitting layer comprised of a 1st host component (which corresponds to the second dopant), a 2nd host component (the light-emitting layer material) and a dopant (which corresponds to the first dopant). Jarikov lists many examples specifically in Table 3, columns 81-132). Specifically Jarikov describes the device where the light-emitting layer material is TBADN, the first dopant is pentacene (a polyaromatic hydrocarbon), and the second dopant is TBP (tetra-tert-butylperylene), a polyaromatic hydrocarbon. Jarikov does not disclose the EV, EC and EG values for the materials, but these values are inherent to the materials themselves. The Values for TBADN come from the values for AND (non-alkylated analog) in the specification (table 1), the values for pentacene come from Rost et al., and the values for TBP come from the values for Perylene (a non-alkyl substituted analog), as disclosed by Jiang et al.. The values are as follows.

66. Component 0: TBADN (similar to H3) EV0 = 5.7, EC0 = 2.7, EG0 = 3.0

67. Component 1: pentacene EV1 = 5.0, EC1 = 2.9 EG1 = 2.1

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68. Component 2: TBP (similar to perylene)) $EV2 = 5.3$, $EC2 = 2.5$, $EG2 = 2.8$

69. Therefore:

70. $EV0 (5.7) > EV1 (5.0)$, $EV0 (5.7) > EV2 (5.3)$

71. $EC0 (2.7) > EC2 (2.5)$

72. $EG0 (3.0) > EG1 (2.1)$, $EG0 (3.0) > EG2 (2.8)$

73. Concerning claim 4, Jarikov describes the electroluminescent device discussed above. Jarikov further disclose in table 3 that the content of the first dopant (pentacene) is 0.2% and the second dopant (TBP) is 2%.

74. Concerning claim 5, Jarikov describes the electroluminescent device from claim 1 above, where the second dopant (TBP) is a known electron transporting material, as disclosed in the specification.

75. Concerning claim 6, Jarikov describe the electroluminescent device discussed above, where the difference between $EC0$ and $EC2$ is 0.2.

76. Concerning claim 7, Jarikov describes the electroluminescent device discussed above, where all of the materials have a molecular weight between 100 and 1500.

77. Concerning claim 9, Jarikov describes the electroluminescent device discussed above, where the first dopant is a condensed aromatic ring compound.

78. Concerning claim 10, Jarikov describes the electroluminescent device discussed above, where the host (light-emitting layer material) is TBADN, which is known to conduct electrons.

79. Concerning claim 11, Jarikov describes the electroluminescent device discussed above, where the host (light-emitting layer material) is TBADN, which is a naphthylanthracene derivative.

80. Claims 2-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Jarikov (7,183,010) with evidence supplied by Jiang et al. (Thin Solid Films, vol. 401, pp. 251-254, 2001)

81. Concerning claim 2, Jarikov describes electroluminescent devices comprised of a pair of electrodes (ITO and Mg:Ag) (example 1, column 74, lines 39-51) and a light emitting layer comprised of a 1st host component (which corresponds to the second dopant), a 2nd host component (the light-emitting layer material) and a dopant (which corresponds to the first dopant). Jarikov lists many examples specifically in Table 3, columns 81-132). Specifically Jarikov describes the device where the light-emitting layer material is TBADN, the first dopant is perylene (a polyaromatic hydrocarbon), and the second dopant is TBP (tetra-tert-butylperylene), a polyaromatic hydrocarbon. Jarikov does not disclose the EV, EC and EG values for the materials, but these values are inherent to the materials themselves. The Values for TBADN come from the values for ADN (non-alkylated analog) in the specification (table 1), the values for perylene and TBP are the same since one is simply an alkylated form of the other and are disclosed by Jiang et al.. The values are as follows.

82. Component 0: TBADN (similar to H3) EV0 = 5.7, EC0 = 2.7, EG0 = 3.0

83. Component 1: Perylene EV1 = 5.3, EC1 = 2.5 EG1 = 2.8

84. Component 2: TBP (similar to perylene)) EV2 = 5.3, EC2 = 2.5, EG2 = 2.8

85. Therefore:

86. EV0 (5.7) > EV1 (5.3) and EV0 (5.7) > EV2 (5.3)

87. EC0 (2.7) > EC1 (2.5) and EC0 (2.7) > EC2 (2.5)

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88. Concerning claim 3, Jarikov discloses two separate mixtures of the materials, where the concentration of the second dopant changes. The CIE coordinates of the two devices are given in Table 3, and are different for the two devices. Therefore, light emission must be caused by the combination of the two materials, since the light color changed with the change in concentration.

89. Claim 8 is rejected under 35 U.S.C. 102(e) as being anticipated by Jarikov (7,183,010) with evidence supplied by Jiang et al. (Thin Solid Films, vol. 401, pp. 251-254, 2001) and Rost et al. (Synthetic Metals, vol 146, pp. 237-241, 2004) and further evidence supplied by Tsai et al. (Applied Physics Letters, vol 89, pp. 243521-1-243521-3, 2006).

Concerning claim 8, Jarikov describes the electroluminescent device as discussed above. They do not report the glass transition temperature of the light emitting layer, however. The glass transition temperature is an inherent feature of the material forming the layer, in this case, predominantly TBADN. Tsai et al. report the glass transition temperature of TBADN to be 126°C. Therefore, it would be reasonable for the layer composed of mostly TBADN to have a glass transition temperature above 100°C.

Claim Rejections - 35 USC § 103

90. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

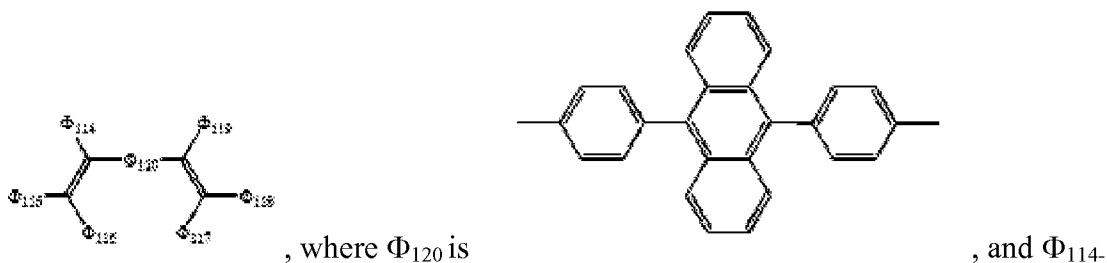
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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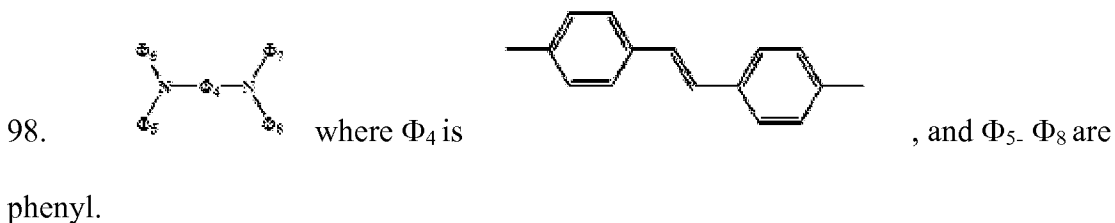
91. Claims 1,4-7, and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatwar et al. (6,475,648) with evidence from Shi et al. (Applied Physics Letters, vol. 80, no. 17, April 2002).
92. Concerning claims 1,4-7, and 10-11, Hatwar et al. describe the electroluminescent device discussed above.
93. While Hatwar et al. does not explicitly include the anthracene compound in the electroluminescent device, due to the explicit teaching of the anthracene compound as a host material by Hatwar et al. it would have been obvious to one of ordinary skill in the art to use the anthracene compounds disclosed by Hatwar et al. as the host material in the electroluminescent device, since they would be predicted to function in the same way.
94. Claims 1-7 and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobori et al. (6,285,039).
95. Concerning claim 1, Kobori et al. describe electroluminescent devices comprising an anode and cathode (pair of electrodes) and a light emitting layer. The light emitting layer is a mixed layer of hole transport and injecting material and electron transport and injecting material doped with coumarin compounds, quinacridone compounds, or styryl amine compounds. (column 4, lines 5-9) The host for the light emitting layer includes phenylanthracene derivatives and tetraarylethylene derivatives (column 22, lines 54-56), and that the mixture of the electron transporting compound and the hole transporting compound can be determined in accordance with carrier density and carrier mobility (column 24, lines 39-45).

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96. Electron transporting host materials include compounds such as compound E-4-701 (shown below) (column 381, line 32-column 382, line 36 and column 513-514) (correspond to component 0)



97. Hole transporting host materials include compounds such as H-2-501 (shown below) (column 81, line 35- column 82-37, and column 103-104). (corresponds to component 2)



99. Dopants include coumarins or styrylamines as discussed above, and may be used alone or in a mixture of two or more (corresponds to component 1) (column 31, lines 7-8).

100. Because of the similarity in the structures, it would be reasonable to predict that the EC and EV and EG values would be roughly equivalent to those reported in Applicant's Table 1.

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101. While Kobori et al. do not explicitly teach the above combination, due to the general teaching combined with the explicit structures reported by Kobori et al. it would have been obvious to one of ordinary skill in the art to construct the electroluminescent device as described, since it would be predicted to work as described.

102. Concerning claims 2-3, the case where the styrylamine compound is used as a dopant in a mixed layer of the anthracene compound (electron transporting host) and styrylamine host (hole transporting host), would describe a device according to claims 2 and 3.

103. Concerning claim 4 Kobori et al. disclose that the level of the dopant (either coumarin or styrylamine) in 0.01 to 20% by weight of the light emitting layer (column 24, lines 3-6).

104. Concerning claim 5, Kobori et al. describe the electroluminescent device discussed above. As described, the second dopant is a hole transport material, as described above.

105. Concerning claim 6, Kobori et al. describe the electroluminescent device discussed above, where the materials have structures very similar or identical to materials of Applicants' table 1, where the EC level of the light emitting layer material and the EC2 of the second dopant material are within 0.4 eV.

106. Concerning claim 7, Kobori et al. describe the electroluminescent device discussed above, where all the materials have a molecular weight between 100 and 1500.

107. Concerning claim 9, Kobori et al. describe the electroluminescent device discussed above, where the either or both of the first dopant and second dopant are styrylamine derivatives

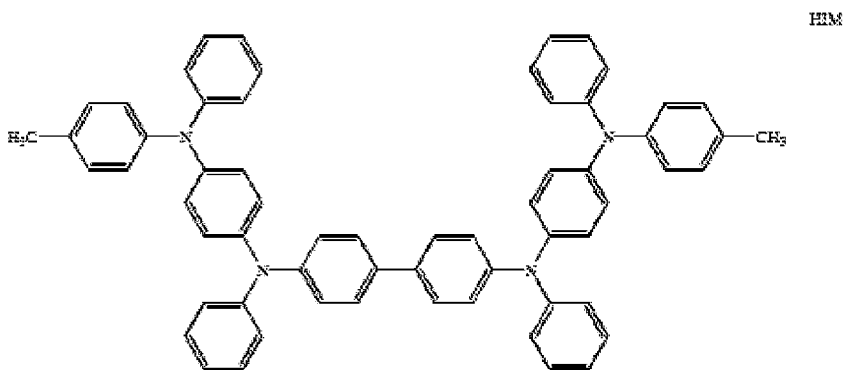
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108. Concerning claim 10, Kobori et al. describe the electroluminescent device discussed above, where the host (light emitting layer material) has electron transport properties as described above.

109. Concerning claim 11, Kobori et al. describe the electroluminescent device discussed above, where the host (light emitting layer material) is a phenylanthracene derivative.

110. Concerning claim 12, Kobori et al. describe the electroluminescent device discussed above, where the phenylanthracene derivative has an alkenyl group.

111. Concerning claim 13, Kobori et al. describe the electroluminescent device discussed above, including a hole injection layer comprised of HIM (shown below), which has a phenylenediamine structure. (column 559, lines 1-4 and column 557-558).



112. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kobori et al. (6,285,039) as applied to claim 1-7 and 9-13 above, and further in view of Hosokawa et al. (6,743,948).

113. Concerning claim 8, Kobori et al. describe the electroluminescent device discussed above, but do not explicitly disclose the glass transition temperature of the light

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emitting layer. However, since the majority of the layer is an anthracene compound, the glass transition temperature can be estimated.

114. Hosokawa et al. disclose that an unsubstituted anthracene has a glass transition temperature of 100°C or lower, but that adding substituents increases the glass transition temperature. Therefore it would be reasonable to predict that the glass transition temperature of a layer comprising most the substituted anthracene described by Kobori et al. would have a glass transition temperature above 100°C.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael E. Nelson whose telephone number is 571-270-3453. The examiner can normally be reached on M-F 7:30am-5:00pm EST (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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